

ABSTRACT OF THE DISCLOSURE

A multipurpose aerosol medication delivery apparatus that includes a collapsible/expandable, or a fixed volume, or a combination of partially fixed volume and partially collapsible/expandable holding chamber for use with a metered dosed inhaler (MDI) and/or any standard small volume nebulizer. The holding chamber is designed to deliver— aerosol medication particles generated by an MDI; aerosol medication particles generated by a nebulizer; a single gas or a mixture of gases; a single gas or a mixture of gases that can yield a gas density that will enhance aerosol delivery of medication with both MDI and nebulizer; a single gas or a mixture of gases that will yield and deliver an oxygen concentration to a patient ranging from room air concentration to 100%. The device includes a reservoir that stores nebulized aerosol generated during exhalation to be inhaled during the next breath. The device also included a one way valve to prevent carbon dioxide generated during exhalation from rebreathing by not allowing the exhaled air from entering the holding chamber. The device includes an exit port with a second one way valve that allows the exhaled air to exit the device but closes during inhalation to prevent any entrainment of room air gas. The exit port may instead have a filter with one-way valve to trap the exhaled aerosol particles while allowing the exhaled gases to escape. The filter valve will similarly close during inhalation to prevent entrainment of room air gas. The holding chamber will allow a uniform mixture of aerosol medication and gases to flow together during inhalation to the patient via a mouthpiece or a facemask. The holding chamber is connected to a nebulizer chamber with a single or multiple connecting tubes that allow gas mixtures with varying density, viscosity, humidity and concentration of oxygen to flow into the holding chamber from the nebulizer chamber. The pattern of flow of the gas(es) does not disturb the flow of the nebulized medication from the nebulizer chamber to the holding chamber or interfere with the plume generated by an MDI. The device also serves as a facemask for delivering precise concentrations of oxygen or as a 100% non-rebreather mask. The device also serves to deliver precise concentrations of different density gases i.e. nitrogen, helium, oxygen, etc. This will allow varying fractions of inspired oxygen to deliver aerosol medication via MDI or a nebulizer. Thus, the device has the ability to deliver aerosol medication with an MDI or a nebulizer while retaining the ability to simultaneously deliver different density gas mixtures and varying fraction of inspired oxygen without interrupting one for the other.